

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference  Case 21421	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No.  PCT/EP 03/10403	International filing date (day/month/year)  18/09/2003	(Earliest) Priority Date (day/month/year)  27/09/2002
Applicant  ROCHE VITAMINS AG		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☒ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☒ contained in the international application in written form.

☒ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☒ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/10403

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12P17/12 C12N1/21 C12N9/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12P C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, EMBASE, CHEM ABS Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>YANG YONG ET AL: "Involvement of the gapA- and epd (gapB)-encoded dehydrogenases in pyridoxal 5'-phosphate coenzyme biosynthesis in Escherichia coli K-12"</p> <p>JOURNAL OF BACTERIOLOGY, vol. 180, no. 16, August 1998 (1998-08), pages 4294-4299, XP002266176 ISSN: 0021-9193 page 4294; figure 1 page 4298</p> <p>---</p> <p>-/--</p>	1-6

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the international search

7 January 2004

Date of mailing of the international search report

04/02/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Schneider, P

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/10403

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	MITTENHUBER GERHARD: "Phylogenetic analyses and comparative genomics of vitamin B6 (pyridoxine) and pyridoxal phosphate biosynthesis pathways" JOURNAL OF MOLECULAR MICROBIOLOGY AND BIOTECHNOLOGY, vol. 3, no. 1, January 2001 (2001-01), pages 1-20, XP008026190 ISSN: 1464-1801 page 1 -page 3; figure 1; table 1 ---	1-6
A	ZHAO GENSHI ET AL: "An Escherichia coli K-12 tktA tktB mutant deficient in transketolase activity requires pyridoxine (vitamin B-6) as well as the aromatic amino acids and vitamins for growth" JOURNAL OF BACTERIOLOGY, vol. 176, no. 19, 1994, pages 6134-6138, XP002266177 ISSN: 0021-9193 page 6134; figure 1 page 6137 ---	
A	FRANCO M G ET AL: "STRUCTURAL BASIS FOR THE FUNCTION OF PYRIDOXINE 5'-PHOSPHATE SYNTHASE" STRUCTURE, CURRENT BIOLOGY LTD., PHILADELPHIA, PA, US, vol. 9, no. 3, March 2001 (2001-03), pages 245-253, XP001005211 ISSN: 0969-2126 page 245 ---	
A	EP 0 950 715 A (HOFFMANN LA ROCHE) 20 October 1999 (1999-10-20) the whole document ---	
A	MARTENS J-H ET AL: "MICROBIAL PRODUCTION OF VITAMIN B12" APPLIED MICROBIOLOGY AND BIOTECHNOLOGY, SPRINGER VERLAG, BERLIN, DE, vol. 58, 2002, pages 275-285, XP001164113 ISSN: 0175-7598 -----	

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 4, 5 (complete)

A process using a recombinant microorganism producing vitamin B6 and carrying an extra gene coding for erythrose 4-phosphate dehydrogenase

2. Claims: 1-3, 6 (all partially)

A recombinant microorganism producing vitamin B6 and carrying extra genes coding for erythrose 4-phosphate dehydrogenase and 1-deoxy-D-xylulose 5-phosphate synthase and corresponding processes

3. Claims: 1-3, 6 (all partially)

A recombinant microorganism producing vitamin B6 and carrying extra genes coding for erythrose 4-phosphate dehydrogenase and pyridoxol 5'-phosphate synthase and corresponding processes

4. Claims: 1-3, 6 (all partially)

A recombinant microorganism producing vitamin B6 and carrying extra genes coding for erythrose 4-phosphate dehydrogenase and 1-deoxy-D-xylulose 5-phosphate synthase and pyridoxol 5'-phosphate synthase and corresponding processes

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/EP 03/10403

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/10403

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0950715	A	20-10-1999	EP 0950715 A2	20-10-1999
			AU 2372799 A	28-10-1999
			BR 9902362 A	06-06-2000
			CA 2268539 A1	15-10-1999
			CN 1232875 A	27-10-1999
			JP 2000023690 A	25-01-2000
			NO 991738 A	18-10-1999
			US 6060267 A	09-05-2000

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